

A WEB-BASED INTENSITY-DURATION-FREQUENCY TOOL TO UPDATE AND ADAPT LOCAL EXTREME RAINFALL STATISTICS TO CLIMATE CHANGE

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WHY DID WE DEVELOP THE IDFCC TOOL?

Intensity-duration-frequency (IDF) curves provide information on how often extreme rainfall events of various durations and intensities occur. Water-related infrastructure in Canada relies on IDF curves for planning, design, operation and maintenance. Climate change will result in increasing frequency and intensity of extreme rainfall events, yet IDF curves currently in use across Canada do not account for these impacts. As a result, infrastructure built today will not be able to accommodate future extreme rainfall conditions, resulting in increased risk of failure.

The rainfall “Intensity-Duration-Frequency under Climate Change” (IDFCC) tool has been designed to address this gap. The Tool assists water management professionals to easily and quickly assess potential impacts of climate change on IDF curves at a local level, because it uses data from almost any rain monitoring station in Canada.



HOW DOES THE IDFCC TOOL WORK?

THE IDFCC TOOL IS AVAILABLE ONLINE AT WWW.IDF-CC-UWO.CA.

Anyone can access and use the tool free of charge, including water managers, municipal infrastructure professionals, provincial and federal government agencies, researchers, consultants and non-profit groups.

The IDFCC tool is pre-loaded with approximately 700 Environment Canada rain stations. Users can select any rain station that has 10 or more years of data and develop IDF curves based on historical data and curves that are adjusted to reflect climate change. Results can be generated for an future time period up to the year 2100 based on 22 Global Climate Models (GCMs) that simulate various climate conditions to local rainfall data and three future climate scenarios ranging from low to high severity. Users can generate results for either pre-loaded Environment Canada rain stations or for user-created rain stations.

USING THE IDFCC TOOL

After selecting a rain station of interest, users can view information on that rain station, including the length of the data record. To create IDF curves for future climate change conditions, users can select a 20-year projection period for any time between 2006 to 2100, followed by one or multiple GCM or GCM ensemble options. After selecting these options, the tool will automatically downscale GCM results and apply GCM results to the local rain station data, providing future IDF curves in table or graphical format and allowing the user to compare the impacts of multiple RCP scenarios and rainfall return periods, and to compare historical IDF curves to these updated curves.

ACCESS THE IDFCC TOOL AT: WWW.IDF-CC-UWO.CA

WHAT ARE THE IMPLICATIONS FOR DECISION MAKERS?

- Water management professionals across Canada recognize the need to adjust rainfall IDF curves to account for the impacts of climate change, yet there has been limited assistance available for this highly technical task. The IDFCC tool significantly increases capacity at a local level to assess the potential impacts of climate change on infrastructure design standards.
- The IDFCC tool assists in the planning and design of more resilient, sustainable water management infrastructure that can successfully operate over many decades under changing climate conditions.
- Improved planning using this tool will reduce infrastructure maintenance and replacement costs, and help protect people, property and ecosystems from the negative impacts of extreme storms caused by climate change.

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